



Comparative study of symptom profile of catatonia in patients with psychotic disorders, affective disorders and organic disorders

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ABSTRACT

Aim: To compare the symptom profile of catatonia among patients with affective, psychotic and organic disorders.

Methodology: A 46 item catatonia rating scale prepared by combining items from 3 catatonia rating scales, i.e., Bush Francis Catatonia Rating Scale (BFCRS), North off catatonia rating scale and Catatonia rating scale was used.

Results: Study included 53, 45 and 42 patients with psychotic disorders, affective disorders and organic catatonia respectively. No significant difference was seen in the prevalence and severity of various catatonic symptoms between patients with psychotic and affective disorders. Compared to participants in the organicity group, participants in the psychotic group had significantly higher prevalence and severity of posturing. There was no difference in the affective and organicity group in terms of frequency and severity of catatonic symptoms.

Conclusions: Patients with organic catatonia do not differ from those with catatonia due to affective and psychotic disorders in terms of prevalence and severity of signs and symptoms of catatonia except for posturing. The present study suggests that catatonic symptoms in patients with various disorders are not just limited to BFCRS and extend beyond the same.

1. Introduction

Catatonia as a "symptom complex" was first described by Kahlbaum in 1874 (Johnson, 1993) and currently it is viewed as a syndrome of motor abnormality associated with disorders of mood, behavior or thought. The exact prevalence of catatonia is not known, however, it is reported to occur as a presenting complaint in about 7–15% of acute psychiatric inpatients (Fink and Taylor, 2006; Takata et al., 2005). Some of the recent studies suggest a decline in the prevalence of catatonia in inpatient treatment setting with reported prevalence of 4.8–13.5% as assessed by Bush Francis Catatonia Rating scale (BFCRS) (Chalasanani et al., 2005; Dutt et al., 2011; Grover et al., 2015; Seethalakshmi et al., 2008; Thakur et al., 2003). A wide range of signs and symptoms (almost more than 40 signs) are ascribed to catatonia and many scales have been developed for the rating of various signs and symptoms of catatonia (Sienaert et al., 2011). These scales differ in the number of items for assessment of catatonia, the type of items included for assessment of catatonia and suggests that the list of symptoms included in BFCRS may not reflect all the signs and symptoms seen in patients with catatonia.

Considering the importance of catatonia, DSM-5, for the first time

tried to define catatonia in the similar manner across various psychiatric disorders and recommended that it can be used as a specifier for affective, psychotic, organic disorders, autistic spectrum disorder etc. In terms of psychotic disorders, catatonia is not limited to schizophrenia only, but it can be used as a specifier for other psychotic disorders, i.e., brief psychotic disorder, schizophreniform disorder, schizoaffective disorder, and substance-induced psychotic disorder. DSM-5, has provided a list of 12 signs and symptoms for defining catatonia and presence of three or more prominent signs for at least 24 h is sufficient for the diagnosis of catatonia (American Psychiatric Association, 2013). DSM-5 has also removed catatonic subtype of schizophrenia (American Psychiatric Association, 2013).

However, when one attempts to evaluate the signs and symptoms of catatonia reported in literature, very few studies have used structured rating scales to evaluate the signs and symptoms of catatonia. Some of the studies have reported mutism to be the most common symptom of catatonic syndrome (Dutt et al., 2011; Seethalakshmi et al., 2008). Occasional study has attempted to evaluate the cross-national differences in the presentation of catatonia and these studies suggest that some of the classic signs of catatonia, like posturing, catalepsy, staring and stupor are more frequently seen among psychiatric admissions in

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India than in the West (Chalasanani et al., 2005). Studies which have attempted to evaluate the similarities and differences in the symptom profile of catatonia in patients with psychotic and affective disorders have in general reported lack of significant differences between the 2 groups, in terms of prevalence of various signs and symptoms (Grover et al., 2017, 2015). However, occasional studies have also reported that excitation, echo phenomenon and verbigeration are limited to affective disorders only (Thakur et al., 2003). However, it is important to note that most of these studies have been limited to small sample size, with number of cases with definite catatonia limited to 11–52.

Although, catatonia is often reported in many of the organic conditions, there is dearth of systematic data on catatonia due to organic conditions. Most of the data is limited to case reports and small case series (Ahuja, 2000; Arora and Praharaj, 2007; Desai et al., 1984; Gangadhar et al., 1983). The term 'Organic catatonia' has been in medical literature for long and there is abundant literature to support the same (Ahuja and Nehru, 1989; Boerner, 1996; Carroll et al., 1994; Chalela and Kattah, 1999; Gomez et al., 1982; Smith et al., 2012). The patients who have catatonia due to an underlying general medical condition of any etiology can be regarded as having organic catatonia. Only one retrospective study, which included data of 35 patients has attempted to compare the symptom profile of catatonia in children and adolescents due to psychotic disorders, affective disorders and organic illness and this study concluded lack of significant differences in the prevalence of various signs and symptoms of catatonia between these three broad diagnostic groups (Grover et al., 2017). In this background, present study aimed to evaluate the signs and symptoms of catatonia by using a broader list of signs and symptoms and compare the same across patients with affective, psychotic and organic disorders.

2. Material & methods

The study was conducted in a tertiary care hospital and patients were recruited after obtaining written informed consent from the patient and/or their family caregivers. The study was approved by the Institute Ethics Committee.

It was a cross-sectional study. Participants were recruited from the outpatient services, inpatient services, emergency services and those referred to psychiatry consultation-liaison services from general medical and surgical wards.

To be included in the study, the patients were required to be aged more than 15 years. The longitudinal history of the patient was evaluated and patients were categorized into having affective (unipolar depression, bipolar depression and bipolar mania), psychotic disorders (Schizophrenia, psychosis NOS, Acute and transient Psychosis, persistent delusional disorder) as per the International Classification of Diseases (Tenth Revision) criteria (World Health Organization, 1992). This diagnosis was based on detailed evaluation of history from the patient and primary care givers based on a semi-structured interview. Additionally, treatment records including investigations were also reviewed. If required, diagnostic confirmation was done after reduction/resolution of catatonia. Patients with underlying organic etiology (i.e., any general medical condition, confirmed on the basis of history and laboratory investigations) were categorized into the organic group. If the diagnosis was not clear in the beginning, than the diagnosis was left open, till the patient's condition improved and all the investigation became available, to categorize the patient into one of the 3 groups. Patients with a clinical picture of delirium prior to developing catatonia were excluded from the study. All those who had an organic cause for catatonia but had a history of pre-existing psychiatric illness were excluded from the study.

Those included in the study, were rated on a scale having 46 items, which were drawn from Bush Francis Catatonia Rating Scale (BFCRS) (Bush et al., 1996), North off catatonia rating scale (NCS) (Northoff et al., 1999) and Catatonia rating scale (CRS) (Bräunig et al., 2000). The 46 items covered all the 23 items of BFCRS, 39 out of the 40 items of

NCS and 9 out of the 21 items of CRS. For all the items, descriptors of the items as per the 3 scales were reviewed and the same were included in the assessment performa to minimize the ambiguity while rating. As the rating of BFCRS, NCS and CRS differ, a uniform rating was made for various items. An item which was not present was given a score of 0 (abnormality absent) and score of 1 was given for an item when the abnormality was definitely present but was of moderate intensity and occasionally present with possibilities of interruptions. A score of 2 was given for an item when the abnormality was definitely present for the most of the time with occasional interruptions. A score of 3 indicated presence of the abnormality constantly, at severe intensity without the possibility of interruptions.

The ratings were done by trainees residents under the supervision of a trained qualified psychiatrist or directly by a qualified psychiatrist attending to the subject per the situation/setting.

Baseline rating on the new catatonia rating scale was done and then all the study subjects were administered the lorazepam challenge test (administration of slow intravenous lorazepam in the dose of 1 mg and noting the response on catatonia signs/symptoms after 10 min; response was defined as reduction in the scores by 50%) and response to it was noted. The response/non-response and new scores after the lorazepam Challenge test were noted. The details of the study procedure have been provided in Figure 1.

The SPSS version 14.0 for Windows (Chicago, Illinois, USA) was used for analysis of data. Frequencies with percentages were calculated for nominal and ordinal variables and mean and standard deviation was calculated for the continuous variables. Chi-Square test, one way ANOVA with post-hoc Scheffe test and t-test were used for comparisons of the three groups. For variables with skewed distribution, non-parametric tests like Kruskal-Willis test and Mann-Whitney test were used for comparison. To take care of multiple comparisons, Bonferroni correction was done and statistical significance was fixed at p value ≤ 0.001 (0.05/46).

3. Results

140 patients with catatonia were evaluated as part of this study. In terms of etiology, 53 patients had psychotic illness, 45 had affective disorders and 42 had catatonia due to an organic etiology.

The mean age of the study sample was 38.83 (SD-18.92) years with nearly equal representation of subjects of either gender. Those who were married outnumbered currently single patients. Similarly, patients from rural locality outnumbered those from urban locality (Table 1). When the 3 study groups were compared, patients with psychotic disorders were significantly younger than patients with affective disorder and those with underlying organicity. However, the age of patients with affective disorders and those with underlying organicity did not differ significantly.

4. Clinical profile of the 3 groups

The mean age of onset of the study sample was 34.77 (SD-18.61) years. Majority of the patients had acute onset of catatonia. The mean total duration of illness was 48.81 (SD-86.55) months and the mean duration of catatonia was 26.47 (SD-33.73) days at the time of assessment.

The underlying medical/physical condition leading to catatonia in the organic group (N = 42) were septic encephalopathy (N = 23;16.4%), uremic encephalopathy (N = 5;3.6%), cerebro-vascular accident (N = 2;1.4%), lupus encephalopathy (N = 2;1.4%), tubercular meningitis (N = 2;1.4%), post traumatic brain injury (N = 1;0.7%), viral meningitis (N = 1;0.7%), interstitial lung disease (N = 1;0.7%), hepatic encephalopathy (N = 1;0.7%), refractory epilepsy (N = 1;0.7%), fronto-temporal dementia (N = 1;0.7%), pneumonia (N = 1;0.7%) and multi-organ failure (N = 1;0.7%). In the psychotic group, majority of the patients were diagnosed with

Table 1
Socio-demographic comparison of the 3 groups.

Variables	Whole group N = 140 Mean (SD)/N %;Range	Psychotic disorder Group I N = 53 Mean (SD)/N%;Range	Affective disorder Group II N = 45 Mean (SD)/N %;Range	Organic illness Group III N = 42 Mean (SD)/N %;Range	Chisquare/ ANOVA (with post-hoc Scheffe test) (p-value)
Age (in years) at presentation	38.83 (18.92); 13-88	30.22(11.63);15-62	45.44 (18.00); 19-85	42.61 (23.16); 13-88	F = 10.272(< 0.001) I < II***;I < III**;II < III
Gender	71 (50.7%)	29(54.7%)	25(55.6%)	17(40.5%)	X ² = 2.523(0.283)
Female	69 (49.3%)	24(45.3%)	20(44.4%)	25(59.5%)	
Marital status	76 (54.3%)	19 (35.8%)	32 (71.1%)	25 (59.5%)	X ² = 12.857 (0.002)
Currently married	64 (45.7%)	34 (64.2%)	13 (28.9%)	17(40.5%)	
Currently single					
Locality	57 (40.7%)	16(30.2%)	25 (55.6%)	16 (38.1%)	X ² = 6.658(0.036)
Urban	83 (59.3%)	37 (69.8%)	20 (44.4%)	26 (61.9%)	
Rural					

* p < 0.05; **p < 0.01.

schizophrenia (N = 29; 54.7%), followed by diagnosis of psychosis NOS (N = 15; 28.3%) and Acute and transient psychotic disorders (N = 9; 17%). In the affective disorder group, majority of the patients were diagnosed with first episode major depressive disorder (N = 23; 51.1%), followed by recurrent depressive disorder (N = 12; 26.7%) and bipolar depression (N = 10; 22.2%).

In more than two-thirds of patients (71.4%), the catatonic symptoms had a continuous course. In three-fifths of the patients, mutism (60%) was the first symptom to appear and this was followed by staring (15%), posturing (6.4%), rigidity (5.7%), excitement (2.9%) and immobility (2.1%). In all the subjects, lorazepam challenge test was undertaken and about two-third of the patients (67.1%) responded to lorazepam challenge test. When the 3 groups were compared, patients with psychotic disorders had significantly younger age of onset when compared with other 2 groups. However, the other 2 groups did not differ significantly in terms of age of onset of symptoms. Compared to other 2 groups, patients with organic illnesses more often had acute onset of catatonic symptoms and less often had past history of catatonia. The mean duration of total illness in the organic group was significantly shorter than the mean duration of total illness in the patients with affective disorder and psychotic group. The organic group had shorter duration of catatonic symptoms (in days) as compared to psychotic and affective groups. All the 3 groups did not differ significantly in terms of presence of family history of mental disorders (Table 2).

5. Comparison of the symptom profile of the 3 groups

Frequency and severity of various symptoms of catatonia is shown in Tables 3 and 4. As is evident from Table 3, the most common catatonic symptoms in the study sample was mutism (94.3%) and this was followed by autism (83.6%), staring (82.1%), loss of initiative (72.9%), flat affect (69.3%), rigidity (67.1%), negativism (64.3%), stupor (60.0%), posturing (59.3%) and gagenhalten (47.1%). Comparison of psychotic and affective disorders group revealed significantly higher prevalence of posturing and akinesia in the psychotic disorder group, however this difference was not significant after Bonferroni correction (Table 3). When psychotic group was compared with the organicity group, frequency of posturing was significantly higher in the psychotic group, even after the after Bonferroni correction. When affective disorders group was compared with organicity group, frequency of stereotypy, posturing, affect related behaviours, flat affect, affective lence, anxiety, abnormal speech, loss of initiative and vegetative abnormalities were more prevalent in the affective disorders group; whereas stupor was more prevalent in the organicity group but these differences were not statistically significant after the Bonferroni correction (Table 3).

In terms of severity of symptoms, the items which had highest severity ratings were mutism, autism, loss of initiative, staring, flat affect, rigidity and posturing (Table 4). When psychotic and affective disorder groups were compared, there was no statistical significant difference in any item severity. When the severity of various symptoms across psychotic group and the organicity group was compared, patients in the psychotic group had higher severity of posturing only and had higher overall total score after Bonferroni correction. When comparisons were limited to affective and organicity group, after Bonferroni correction significant difference were noted for mutism only. (Table 4).

When psychotic and affective disorder were combined and compared with organic disorder group, compared to the organicity group, frequency and severity of posturing was significantly higher in the combined (psychotic + affective disorders) group.

When response to lorazepam was compared in the 3 groups, no significant difference was noted [Responders – Psychotic group (N = 36; 67.92%), affective group (N = 31;68.88%) and organic group (N = 27;64.28%); Chi-square value -0.232;p-value-0.89].

6. Discussion

This study aimed to explore the signs and symptoms of catatonia by using a broader list of signs and symptoms and compare the same across patients with affective, psychotic and organic disorders. The list of catatonic signs and symptoms were derived from three scales (BFCRS, NCS and CRS) which comprised of 46 items. Most of the earlier studies on catatonia have relied upon BFCRS to evaluate the symptom profile of catatonia (Chalasan et al., 2005; Dutt et al., 2011; Grover et al., 2017, 2015; Kaelle et al., 2016; Lee et al., 2000; Takács et al., 2017). Accordingly, the signs and symptoms evaluated as part of this study provide a broader perspective to signs and symptoms of catatonia. However, the list included all the items of BFCRS, which makes the findings of the present study comparable with many of the available studies.

Patients with psychotic disorders were much younger than the other two groups. This finding is understandable, considering the fact that a significant proportion of the patients with affective disorders were diagnosed with recurrent affective disorder. Higher age of patients with organic disorders is also understandable, considering the higher prevalence of physical disorders in older subjects (Karamangla et al., 2007). There were no gender differences noted in the present study across the 3 groups. However, previous studies have reported that more females present with catatonia during an affective episode (Medda et al., 2015; Starkstein et al., 1996).

Patients with psychotic illness in the present study had a younger age at onset of catatonic symptoms when compared with the other two

Table 2
Clinical profile of the 3 groups.

Variables	Whole group N = 140 Mean (SD)/N %;Range	Psychotic disorder Group I N = 53 Mean (SD)/N %;Range	Affective disorder Group II N = 45 Mean (SD)/N %;Range	Organic illness Group III N = 42 Mean (SD)/N%;Range	Chisquare/ ANOVA (with post-hoc Scheffe test) (p-value)
Onset of catatonic symptoms	71 (50.7%)	23 (43.4%)	16 (35.6%)	32 (76.2%)	$X^2 = 24.16 (< 0.001)^{***}$
Acute	25 (17.9%)	6 (11.3%)	11 (24.4%)	8(19.0%)	
Sub-acute	44 (31.4%)	24 (45.3%)	18 (40.0%)	2 (4.8%)	
Insidious					
Age of onset (in years)	34.77 (18.61); 10-88	25.30 (10.10); 10-62	39.60 (17.51); 15-83	41.54(22.97); 13-88	$F = 13.09 (< 0.001)^{***}$ I < II**; I < III***; II < III
Total duration of illness (in months)	48.81 (86.55); 0.10-450	59.41 (77.87); 0.10-300	67.04 (113.32); 0.10-450	15.90(48.04); 0.10-300	U (I vs II) = 1178.0(0.917) U (I vs III) = 494.0 (< 0.001)*** U (II vs III) = 427.0 (< 0.001)*** Kruskal-Wallis Value = 26.84 (< 0.001)***
Duration of current catatonic episode (in days)	26.47 (33.73); 1-300	31.75 (35.08); 1-180	27.71 (34.34); 1-180	18.47 (30.46); 1-180	U (I vs II) = 1103.5(0.523) U (I vs III) = 780.0(0.012) U (II vs III) = 744.0(0.086) Kruskal-Wallis Value = 6.403 (0.041)
Course of catatonia	100(71.4%)	37 (69.8%)	30 (66.7%)	33 (78.6%)	$X^2 = 1.618(0.445)$
Continuous	40 (28.6%)	16 (30.2%)	15(33.3%)	9 (21.4%)	
Fluctuating					
Previous H/O catatonia : Yes	23 (16.4%)	13 (24.5%)	9 (20.0%)	1 (2.4%)	$X^2 = 8.987 (0.011)$
Family history of mental illness : Yes	21 (15.0%)	9 (17%)	9 (20.0%)	3(7.1%)	$X^2 = 3.079(0.214)$
First catatonic symptom to appear	1 (.7%)	1 (1.9%)	0	0	
Agitation	1 (.7%)	1 (1.9%)	0	0	
Echolalia	1 (.7%)	0	1 (2.2%)	0	
Echopraxia	4 (2.9%)	4 (7.5%)	0	0	
Excitement	3 (2.1%)	1 (1.9%)	0	2 (4.8%)	
Immobility	84 (60.0%)	27 (50.9%)	27 (60.0%)	30 (71.4%)	
Mutism	1 (.7%)	0	1 (2.2%)	0	
Negativism	1 (.7%)	1 (1.9%)	0	0	
Perseveration	9 (6.4%)	5 (9.4%)	4 (8.9%)	0	
Posturing	8 (5.7%)	1 (1.9%)	4 (8.9%)	3 (7.1%)	
Rigidity	1 (.7%)	0	0	1 (2.4%)	
Slow to respond	21 (15.0%)	11 (20.8%)	7(15.6%)	3 (7.1%)	
Staring	2 (1.4%)	0	0	2 (4.8%)	
Stupor	1 (.7%)	0	1 (2.2%)	0	
Verbigeration	2 (1.4%)	1 (1.9%)	0	1 (2.4%)	
Withdrawal					

* p < 0.05; **p < 0.01;***p < 0.001; U- Mann Whitney U value.

groups. This finding is in line with the existing literature which suggests that catatonia is more prevalent in patients with early onset psychotic illness (Benarous et al., 2017; Takaoka and Takata, 2003) and higher prevalence of patients with psychotic disorders among children and adolescents presenting with catatonia (Grover et al., 2017). The total duration of illness was significantly low in the organic group when compared with the other two groups. This finding is supported by existing studies which suggest that catatonia due to general medical conditions usually has an acute onset and shorter duration of illness (Ahuja, 2000; Rabello et al., 2014).

In the present study, in 60% of the patients (n = 84), mutism was the first symptom to appear and this was followed by staring, posturing, rigidity, excitement and immobility. None of the previous studies have reported about the type of first symptom of catatonia. This finding possibly suggests that whenever a patient exhibits mutism, it can be considered as a sign of impending catatonia. However, this finding must be considered as preliminary and must be replicated in future.

Many previous studies have focused on the prevalence of various signs and symptoms of catatonia and these reveal that mutism, immobility/stupor, staring, negativism, rigidity and posturing are the usual signs and symptoms seen in patients with catatonia due to any etiology (Dutt et al., 2011; Grover et al., 2017; Swain et al., 2017). In the present study irrespective of the diagnostic group, the most common catatonic symptoms in the study sample were mutism (94.3%), autism (83.6%), staring (82.1%), loss of initiative (72.9%), flat affect (69.3%), rigidity (67.1%), negativism (64.3%), stupor

(60.0%), posturing (59.3%) and gagenhalten (47.1%). When we compare the finding of the present study with the previous studies, it is evident that findings are comparable with the existing studies (Dutt et al., 2011; Grover et al., 2017; Kaelle et al., 2016; Medda et al., 2015; Starkstein et al., 1996; Swain et al., 2017; Takács et al., 2017), except for the fact that many of the signs and symptoms, which are not considered in BFCRS are also quite prevalent in patients with catatonia. Similarly, the symptom profile reported for patients with affective disorder and psychotic disorders in the present study is also comparable with the existing literature, barring the fact that findings of the previous studies (Grover et al., 2015; Medda et al., 2015; Worku and Fekadu, 2015) were limited by the coverage of the scale.

In the present study, the prevalence and severity of various signs and symptoms did not differ significantly between the psychotic and affective groups. Previous studies which have used BFCRS have also come up with similar findings of lack of significant differences in the symptom profile of catatonia between psychotic and affective groups (Dutt et al., 2011; Grover et al., 2017, 2015; Worku and Fekadu, 2015). This lack of difference in the prevalence of various catatonic signs and symptoms across the psychotic and affective disorders, at one level, provides support to the DSM-5 contention of using similar list for assessment of catatonia across different diagnostic groups.

When psychotic group and affective group were compared individually with the organic group, statistically significant difference was noted only for the item of posturing. Only one previous retrospective study attempted to compare the symptom profile of these 3

Table 3
Comparison of frequency of catatonic features in the 3 groups.

Variables	Whole group N = 140 Baseline Frequency (%)	Psychotic illness (Group I) N = 53 Baseline Frequency (%)	Affective disorder (Group II) N = 45 Baseline Frequency (%)	Organic illness (Group III) N = 42 Baseline Frequency (%)	Comparison of I Vs II Chi-square (p-value)	Comparison of I vs III Chi-square (p-value)	Comparison of II vs III Chi-square (p- value)	Comparison of (I + II)vs III Chi-square (p-value)
Mannerism : Present	20 (14.3)	12 (22.6)	6 (13.3)	2 (4.8)	1.406(0.236)	5.961(0.015)	1.91(0.167)	4.44(0.035)
Stereotypy: Present	12 (8.6)	7 (13.2)	5 (11.1)	0 (0)	0.100(0.752)	F=0.016	4.95(0.026)	F = 0.018
Festination: Present	9 (6.4)	4 (7.5)	3(6.7)	2 (4.8)	F = 1.00	0.307(0.579)	F = 1.00	0.277(0.599)
Iterations: Present	8 (5.7)	2(3.8)	5(11.1)	1(2.4)	F = 0.242	F = 1.00	F = 0.204	1.237(0.266)
Athetotic movements: present	6 (4.3)	2(3.8)	4(8.9)	0(0)	F = 0.409	F = 0.501	F = 0.117	F = 0.178
Dyskinesia : Present	13 (9.3)	6 (11.3)	4 (8.9)	3 (7.1)	0.157(0.692)	0.477(0.490)	F = 1.00	0.327(0.567)
Gagenhalten: Present	66 (47.1)	27 (50.9)	21 (46.7)	18 (42.9)	0.178(0.673)	0.615(0.433)	0.127(0.721)	0.442(0.506)
Posturing : Present	83 (59.3)	42 (79.2)	26 (57.8)	15 (35.7)	5.280(0.022)	18.50(< 0.001)***	4.244(0.039)	13.81(< 0.001)***
Catalepsy : Present	50 (35.7)	24 (45.3)	16 (35.6)	10 (23.8)	0.953(0.329)	4.702(0.030)	1.43(0.232)	3.704(0.054)
Flexibilitas : present	24 (17.1)	13 (24.5)	5 (11.1)	6 (14.3)	2.922(0.087)	1.536(0.215)	0.198(0.656)	0.345(0.557)
Rigidity : Present	94 (67.1)	36 (67.9)	31 (68.9)	27 (64.3)	0.010(0.919)	0.139(0.709)	0.207(0.649)	0.222(0.638)
Muscular hypotonia: Present	17 (12.1)	7 (13.2)	4 (8.9)	6 (14.3)	0.456(0.500)	0.023(0.879)	0.622(0.430)	0.258(0.611)
Sudden muscular tone alterations: Present	18 (12.9)	9 (17.0)	6 (13.3)	3 (7.1)	0.250(0.617)	2.055(0.152)	0.898(0.343)	1.749(0.186)
Akinesia: Present	49 (35.0)	24 (45.3)	11 (24.4)	14 (33.3)	4.603(0.032)	1.39(0.238)	0.838(0.360)	0.073(0.787)
Compulsive motions: Present	23(16.4)	12 (22.6)	8 (17.8)	3 (7.1)	0.354(0.552)	4.23(0.040)	2.22(0.136)	3.768(0.052)
Emotional lability: Present	28 (20.0)	12 (22.6)	10 (22.2)	6 (14.3)	0.002(0.960)	1.06(0.302)	0.912(0.34)	1.22(0.268)
Impulsivity: Present	20 (14.3)	10 (18.9)	6 (13.3)	4 (9.5)	0.546(0.460)	1.62(0.202)	0.31(0.578)	1.11(0.292)
Aggression: Present	28 (20.0)	16 (30.2)	9 (20.0)	3 (7.1)	1.329(0.249)	7.77(0.005)	3.02(0.082)	6.19(0.013)
Excitement : Present	23 (16.4)	13 (24.5)	6 (13.3)	4 (9.5)	1.952(0.162)	3.59(0.058)	0.310(0.578)	2.08(0.149)
Affect related behaviours: Present	39 (27.9)	16 (30.2)	17 (37.8)	6 (14.3)	0.628(0.428)	3.33(0.068)	6.165(0.013)	5.49(0.019)
Flat affect: Present	97 (69.3)	39 (73.6)	36 (80.0)	22 (52.4)	0.558(0.455)	4.584(0.032)	7.45(0.006)	8.05(0.005)
Affective latence: Present	44 (31.4)	17 (32.1)	20 (44.4)	7 (16.7)	1.584(0.208)	2.947(0.086)	7.83(0.005)	6.06(0.014)
Anxiety : Present	36 (25.7)	15 (28.3)	17 (37.8)	4 (9.5)	0.994(0.319)	5.164(0.023)	9.47(0.002)	8.234(0.004)
Ambivalence: Present	36 (25.7)	20 (37.7)	10(22.2)	6 (14.3)	2.757(0.097)	6.482(0.011)	0.912(0.34)	4.103(0.043)
Staring: Present	115 (82.1)	45 (84.9)	36 (80.0)	34 (81.0)	0.408(0.523)	0.261(0.609)	0.013(0.911)	0.058(0.810)
Blinking: Present	28 (20.0)	12 (22.6)	10 (22.2)	6 (14.3)	0.002(0.960)	1.065(0.302)	0.91(0.34)	1.22(0.268)
Agitation: Present	22 (15.7)	11 (20.8)	7 (15.6)	4 (9.5)	0.439(0.508)	2.22(0.136)	0.716(0.398)	1.73(0.188)
Grimacing: Present	32 (22.9)	14 (26.4)	9 (20.0)	9 (21.4)	0.558(0.455)	0.318(0.573)	0.027(0.869)	0.069(0.792)
Verbigeration: Present	13 (9.3)	6 (11.3)	4 (8.9)	3 (7.1)	0.157(0.692)	0.477(0.49)	F = 1.00	0.327(0.567)
Preservations: Present	12 (8.6)	8 (15.1)	4 (8.9)	0 (0)	0.872(0.350)	F = 0.008	F = 0.117	F = 0.018
Increased speech: Present	7 (5.0)	3 (5.7)	3 (6.7)	1 (2.4)	F = 1.00	F = 0.627	F = 0.617	0.866(0.352)
Abnormal speech: Present	23 (16.4)	9 (17.0)	11 (24.4)	3 (7.1)	0.835(0.361)	2.05(0.152)	4.81(0.028)	3.768(0.052)
Automatic obedience: Present	19(13.6)	12 (22.6)	4 (8.9)	3 (7.1)	3.369(0.066)	4.23(0.04)	F = 1.00	2.114(0.146)
Echolalia: Present	17 (12.1)	9 (17.0)	6 (13.3)	2 (4.8)	0.250(0.617)	3.417(0.065)	1.911(0.167)	3.064(0.080)
Mitgehen: Present	33 (23.6)	16 (30.2)	11 (24.4)	6 (14.3)	0.402(0.526)	3.33(0.068)	1.426(0.232)	2.872(0.090)
Compulsive behaviour: Present	12(8.6)	6 (11.3)	5 (11.1)	1 (2.4)	0.001(0.974)	F=0.129	2.57(0.108)	2.934(0.087)
Negativism: Present	90 (64.3)	36 (67.9)	30 (66.7)	24 (57.1)	0.18(0.895)	1.171(0.279)	0.837(0.360)	1.33(0.248)
Autism: Present	117 (83.6)	47 (88.7)	38 (84.4)	32 (76.2)	0.379(0.538)	2.609(0.106)	0.941(0.332)	2.381(0.123)
Mutism: Present	132(94.3)	50 (94.3)	41 (91.1)	41 (97.6)	0.382(0.536)	0.625(0.429)	1.697(0.192)	1.237(0.266)
Stupor: Present	84 (60.0)	30 (56.6)	23 (51.1)	31 (73.8)	0.296(0.587)	3.018(0.082)	4.754(0.029)	4.768(0.029)
Loss of initiative: Present	102 (72.9)	43 (81.1)	36 (80.0)	23 (54.8)	0.020(0.888)	7.683(0.006)	6.34(0.012)	9.93(0.002)
Vegetative abnormalities: Present	39 (27.9)	16 (30.2)	17 (37.8)	6 (14.3)	0.628(0.428)	3.33(0.068)	6.16(0.013)	5.49(0.019)
Combativeness: Present	15 (10.7)	9 (17.0)	4 (8.9)	2 (4.8)	1.385(0.239)	3.41(0.065)	F=0.677	2.22(0.136)
Grasp reflex: Present	12 (8.6)	5 (9.4)	5 (11.1)	2 (4.8)	0.075(0.785)	0.749(0.387)	F = 0.435	1.11(0.292)
Jerky movements: Present	8 (5.7)	2 (3.8)	5 (11.1)	1 (2.4)	1.975(0.160)	F = 1.00	2.57(0.108)	1.237(0.266)
Rituals: Present	6 (4.3)	3 (5.7)	2 (4.4)	1 (2.4)	F = 1.000	F = 0.627	F = 1.00	0.531(0.466)

F = Fischer's exact value.

groups in the children and adolescents. This study did not report any significant differences in the three groups of patients with catatonia (Grover et al., 2017). In contrast to the previous study, present prospective study, with wider coverage of signs and symptoms, reveals that, perhaps, the symptom of catatonia due to organic etiology, does not differ from patients with functional psychiatric disorders. This finding provides support to the DSM-5 contention of using the same set of signs and symptoms for diagnosing catatonia across organic and functional disorders.

In terms of severity of symptoms, the items which had highest

severity ratings were mutism, autism, loss of initiative, staring, flat affect, rigidity and posturing. Earlier studies have not focused on the severity of catatonic symptoms across different diagnostic groups (Chalasanani et al., 2005; Grover et al., 2017; Swain et al., 2017; Worku and Fekadu, 2015). Present study reveals certain differences in the severity rating across the 3 diagnostic groups, with main differences between functional and organic groups, which require further replication.

Present study is limited by the fact that this was a hospital based study, which possibly included patients with very obvious well recognized catatonic symptoms. It is quite possible that patients who had

Table 4
Comparison of severity of symptom in the 3 groups.

Variables	Whole group N = 140 Mean (SD); Range	Psychotic illness (Group-I) N = 53 Mean (SD); Range	Affective disorder (Group-II) N = 45 Mean (SD); Range	Organic illness (Group-III) N = 42 Mean (SD); Range	Comparison of I Vs II Mann Whitney (p-value)	Comparison of I vs III Mann Whitney (p-value)	Comparison of II vs III Mann Whitney (p-value)	Kruskal-Wallis H value of three groups (p-value)
Mannerism	.200 (.52); 0-3	.33(.70); 0-3	.15 (.42); 0-2	.07 (.26); 0-1	1072.0(0.202)	933.0(0.033)	885.0(0.334)	4.989(0.083)
Stereotypy	.08 (.28); 0-1	.13 (.34); 0-1	.11 (0.31); 0-1	0	1167.5(0.754)	966.0(0.015)	840.0(0.027)	5.72(0.057)
Festination	.085 (.32); 0-2	.07 (.26); 0-1	.11 (.43); 0-2	.07 (.26); 0-1	1186.0(0.917)	1108.5(0.941)	943.0(0.977)	0.012(0.994)
Iterations	.085 (.406); 0-3	.17 (.43); 0-3	.15 (.52); 0-3	.02 (.15); 0-1	1106.5(0.170)	1097.0(0.692)	862.0(0.108)	3.610(0.164)
Athetotic movements	.064 (.343); 0-3	.05 (.30); 0-2	.13 (.50); 0-3	0	1132.0(0.299)	1071.0(0.206)	861.0(0.049)	4.189(0.123)
Dyskinesia	.15 (.507); 0-3	.18 (.55); 0-2	.15 (.56); 0-3	.09 (.37); 0-2	1163.5(0.694)	1063.5(0.465)	927.0(0.746)	0.546(0.761)
Gagenhalten	0.92 (1.09); 0-3	1.00 (1.09); 0-3	.77 (.97); 0-3	0.97 (1.23); 0-3	1073.5(0.357)	1083.0(0.806)	901.0(0.680)	0.736(0.692)
Posturing	1.25 (1.18); 0-3	1.75 (1.10); 0-3	1.08 (1.06); 0-3	.78 (1.17); 0-3	798.0(0.003)	618.5(< 0.001)***	781.5(< 0.001)***	17.65(< 0.001)***
Catalepsy	.66 (.97); 0-3	.77 (.97); 0-3	.64 (0.93); 0-3	.54(1.04); 0-3	1097.5(0.443)	926.5(0.102)	865.5(0.402)	2.668(0.263)
Flexibilitas cerea	.31 (.77); 0-3	.39 (.81); 0-3	.22 (.67); 0-2	.30 (0.84); 0-3	1042.5(0.113)	1011.5(0.276)	913.0(0.638)	2.887(0.236)
Rigidity	1.36 (1.16); 0-3	1.33 (1.12); 0-3	1.22 (1.06); 0-3	1.57 (1.34); 0-3	1128.0(0.634)	995.0(0.359)	809.5(0.232)	1.611(0.447)
Muscular hypotonia	.20 (.62); 0-3	.24 (.70); 0-3	.13 (.45); 0-2	.23 (.69); 0-3	1138.0(0.478)	1104.0(0.91)	894.0(0.434)	0.704(0.703)
Sudden muscular tone alterations	.20 (.58); 0-3	.28 (.68); 0-3	.22 (.59); 0-2	.09 (.37); 0-2	1150.0(0.628)	1000.0(0.142)	883.5(0.323)	2.14(0.343)
Alkinesia	.70 (1.07); 0-3	.84 (1.09); 0-3	.44 (.86); 0-3	.78 (1.22); 0-3	940.5(0.035)	1031.5(0.488)	832.5(0.231)	4.28(0.118)
Compulsive emotions	.27 (.65); 0-3	.37(.76); 0-3	.28 (.66); 0-2	.11 (0.45); 0-2	1134.0(0.553)	941.0(0.042)	845.0(0.141)	4.102(0.129)
Emotional lability	.28 (.62); 0-3	.32(.64); 0-3	.33 (.70); 0-3	.19 (.50); 0-2	1189.0(0.973)	1017.0(0.292)	867.0(0.326)	1.29(0.525)
Impulsivity	.20 (.52); 0-3	.24 (.51); 0-3	.20 (.58); 0-3	.14 (.47); 0-2	1110.0(0.371)	995.0(0.163)	910.0(0.591)	2.159(0.34)
Aggression	.32 (.72); 0-3	.47 (.79); 0-3	.35 (.80); 0-3	.11 (.45); 0-2	1080.5(0.296)	859.5(0.006)	823.0(0.084)	7.346(0.025)
Excitement	.23 (.60); 0-3	.39 (.79); 0-3	.13 (.40); 0-2	.14 (.47); 0-2	1023.0(0.073)	945.0(0.059)	933.0(0.847)	5.272(0.072)
Affect related behaviour	.45 (.80); 0-3	.49(.79); 0-2	.57 (.86); 0-3	.26 (.73); 0-3	1121.0(0.542)	940.0(0.019)	731.5(0.019)	5.44(0.066)
Flat affect	1.62 (1.24); 0-3	1.75 (1.25); 0-3	1.68 (1.06); 0-3	1.38 (1.39); 0-3	1113.0(0.554)	957.5(0.216)	845.0(0.374)	1.737(0.42)
Affect latency	.57 (.94); 0-3	.54 (.91); 0-3	.86 (1.09); 0-3	.28 (.70); 0-3	1014.5(0.143)	942.5(0.093)	670.5(0.004)	8.36(0.015)
Anxiety	.40 (.75); 0-3	.41 (.74); 0-3	.60 (.88); 0-3	.16 (.53); 0-2	1068.5(0.286)	913.0(0.032)	684.5(0.003)	8.75(0.013)
Amбиваленс	.45 (.80); 0-3	.69 (.99); 0-3	.37 (.77); 0-3	.23 (.61); 0-2	995.5(0.084)	844.0(0.010)	870.0(0.345)	7.51(0.023)
Staring	1.92 (1.10); 0-3	2.03 (1.05); 0-3	1.73 (1.09); 0-3	2.02 (1.15); 0-3	996.5(0.143)	1094.5(0.882)	782.5(0.147)	2.85(0.24)
Blinking	.40 (.86); 0-3	.50 (.99); 0-3	.37(.80); 0-3	.28 (.74); 0-2	1149.0(0.676)	996.5(0.211)	877.5(0.396)	1.58(0.454)
Agitation	.27 (.66); 0-3	.35 (.73); 0-3	.24 (.64); 0-3	.19 (.59); 0-2	1106.5(0.374)	977.0(0.118)	894.0(0.453)	2.61(0.27)
Grimacing	.38(.78); 0-3	.45 (.84); 0-3	.31 (.70); 0-3	.38 (.79); 0-2	1122.5(0.507)	1061.0(0.607)	936.5(0.920)	0.507(0.776)
Verberation	.16 (.55); 0-3	.16 (.50); 0-2	.20 (.69); 0-3	.11 (.45); 0-3	1169.5(0.755)	1068.0(0.507)	926.0(0.732)	0.444(0.801)
Preservations	.15 (.52); 0-3	.28 (.71); 0-3	.13 (.45); 0-2	.11 (.45); 0-3	1113.5(0.322)	945.0(0.009)	861.0(0.049)	6.873(0.032)
Increased speech	.07 (.38); 0-3	.07 (.33); 0-2	.11 (.48); 0-3	.04(0.30); 0-2	1180.0(0.830)	1077.5(0.445)	905.0(0.349)	0.882(0.643)
Abnormal speech	.28 (.73); 0-3	.26 (.68); 0-3	.46 (.94); 0-3	.11 (.45); 0-2	1077.5(0.234)	1024.0(0.230)	779.5(0.028)	5.011(0.082)
Automatic obedience	.19 (.50); 0-2	.33 (.64); 0-2	.11(.38); 0-2	.09 (.37); 0-2	1002.5(0.04)	918.5(0.025)	929.0(0.773)	7.435(0.024)
Echolalia	.19 (.57); 0-3	.28 (.68); 0-3	.20 (.58); 0-3	.07 (.34); 0-1	1144.5(0.585)	976.0(0.065)	864.5(0.172)	3.395(0.183)
Mitgehen	.47 (0.94); 0-3	.60 (1.04); 0-3	.51 (1.01); 0-3	.26 (.70); 0-3	1129.0(0.564)	931.0(0.065)	843.5(0.213)	3.395(0.183)
Compulsive behaviour	.17 (.61); 0-3	.22 (.66); 0-3	.24 (.74); 0-3	.04 (.30); 0-2	1192.5(1.00)	1013.5(0.100)	862.0(0.108)	2.923(0.232)
Negativism	1.55 (1.29); 0-3	1.69 (1.30); 0-3	1.55 (1.25); 0-3	1.35 (1.32); 0-3	1103.5(0.505)	957.0(0.216)	872.0(0.514)	1.608(0.447)
Autism	2.10 (1.12); 0-3	2.30 (1.01); 0-3	2.06(1.11); 0-3	1.88 (1.23); 0-3	1054.0(0.277)	912.0(0.100)	876.5(0.534)	2.884(0.236)
Mutism	2.38 (.961); 0-3	2.49(.82); 0-3	2.04 (0.99); 0-3	2.69 (.68); 0-3	881.5(0.014)	969.5(0.175)	876.5(0.534)	13.56(0.001)***
Stupor	1.37(1.27); 0-3	1.32(1.29); 0-3	1.00 (1.12); 0-3	1.85 (1.26); 0-3	1029.0(0.216)	870.5(0.056)	588.5(0.002)	9.84(0.007)
Loss of initiative	1.82 (1.25); 0-3	2.11 (1.17); 0-3	1.82 (1.15); 0-3	1.45(1.38); 0-3	1002.0(0.147)	820.5(0.018)	809.5(0.292)	6.06(0.048)
Vegetative abnormalities	.57(1.103); 0-3	.67 (1.13); 0-3	.71 (1.07); 0-3	.30 (.81); 0-3	1132.0 (0.607)	932.0(0.066)	732.5(0.020)	5.49(0.064)
Combativeness	.178(.55); 0-3	.30 (.72); 0-3	.11 (.38); 0-2	.09 (.43); 0-2	1069.5(0.149)	960.0(0.047)	909.0(0.486)	4.89(0.086)
Grasp reflex	.157 (.57); 0-3	.13 (.48); 0-3	.22(.70); 0-3	.11 (.55); 0-3	1168.0(0.739)	1064.5(0.422)	886.5(0.0292)	1.12(0.569)
Jerky movements	.071 (.309); 0-2	.05 (.30); 0-1	.11 (.31); 0-1	.04 (.30); 0-2	1107.5(0.174)	1098.0(0.711)	865.0(0.122)	3.427(0.18)
Rituals	.05 (1.24); 0-2	.07 (.33); 0-1	.04 (.20); 0-1	.02 (1.15); 0-1	1177.0(0.772)	1076.0(0.426)	925.5(0.600)	0.63(0.728)
Total CRS	26.12 (11.38); 4-65	30.00 (11.77); 13-65	25.33 (11.01); 4-65	22.09 (9.80); 7-40	t = 2.013(0.047)	t = 3.493(0.001)***	t = 1.444(0.152)	11.123(0.004)

less obvious, not so recognized symptoms were not evaluated for catatonia in the present study. Accordingly, using this extended list of catatonic symptoms as a screening instrument for evaluating all the patients in future may help in identifying more of the so called not well recognized catatonic symptoms. Other limitations of the present study include cross-sectional assessment. Majority of the patients were on some form of psychotropic medications or antibiotics, which could have influenced the prevalence of various catatonic symptoms. However, we had not seen any of our subjects with any type of antipsychotic induced movement disorders who presented with catatonia. We had no control over the subjects as many of them were already on antipsychotics before they visited our services. This can have some effect on presentation of catatonia. Future studies must attempt to overcome these limitations.

To conclude, the present study suggests that patients with organic catatonia do not differ from those with affective and psychotic catatonia on account of prevalence and severity of many signs and symptoms of catatonia. Present study also suggests that in general there is lack of difference in the prevalence and severity of various catatonic signs and symptoms among patients with affective and psychotic disorders. Further, present study suggests that BFCRS may have certain limitation in identifying all the signs and symptoms of catatonia.

Based on the findings of this study, it can be said that the signs and symptoms catatonia or the ‘catatonic’ syndrome does not differ across the various diagnostic groups (functional and non-functional). In other words, the etiology of catatonia does not have much impact on the phenomenology of catatonia. This further validates the diagnostic criteria of catatonia in DSM-5 (Tandon et al., 2013; Heckers et al., 2010) and suggest similar implications for description of catatonia in upcoming ICD-11.

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Conflict of interest

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References

- Ahuja, N., 2000. Organic catatonia: a review. *Indian J. Psychiatry* 42, 327–346.
- Ahuja, N., Nehru, R., 1989. The case for the diagnosis of organic catatonic syndrome. *Am. J. Psychiatry* 146, 1351–1352.
- American Psychiatric Association, 2013. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. American Psychiatric Pub, Arlington, VA.
- Arora, D.M., Praharaj, S.K., 2007. Butterfly glioma of corpus callosum presenting as catatonia. *World J. Biol. Psychiatry* 8, 54–55. <https://doi.org/10.1080/15622970600960116>.
- Benarous, X., Raffin, M., Ferrafiat, V., Consoli, A., Cohen, D., 2017. Catatonia in children and adolescents: new perspectives. *Schizophr. Res.* <https://doi.org/10.1016/j.schres.2017.07.028>.
- Boerner, R.J., 1996. Organic catatonic disorder—on the occurrence of a catatonic syndrome in a patient with encephalomyelitis disseminata. *Psychiatr. Prax.* 23, 40.
- Bräunig, P., Krüger, S., Shugar, G., Höfler, J., Börner, I., 2000. The catatonia rating scale I—development, reliability, and use. *Compr. Psychiatry* 41, 147–158.
- Bush, G., Fink, M., Petrides, G., Dowling, F., Francis, A., 1996. Catatonia. I. Rating scale and standardized examination. *Acta Psychiatr. Scand.* 93, 129–136.
- Carroll, B.T., Anfinson, T.J., Kennedy, J.C., Yendrek, R., Boutros, M., Bilon, A., 1994. Catatonic disorder due to general medical conditions. *J. Neuropsychiatry Clin. Neurosci.* 6, 122–133. <https://doi.org/10.1176/jnp.6.2.122>.
- Chalasanani, P., Healy, D., Morriss, R., 2005. Presentation and frequency of catatonia in new admissions to two acute psychiatric admission units in India and Wales. *Psychol. Med.* 35, 1667–1675. <https://doi.org/10.1017/S0033291705005453>.
- Chalela, J., Kattah, J., 1999. Catatonia due to central pontine and extrapontine myelinolysis: case report. *J. Neurol. Neurosurg. Psychiatry* 67, 692–693. <https://doi.org/10.1136/jnnp.67.5.692>.
- Desai, N.G., Patil, N.M., Gangadhar, B.N., Pradhan, N., Channabasavanna, S.M., 1984. Catatonia associated with Uraemic Encephalopathy. *Indian J. Psychiatry* 26, 95–96.
- Dutt, A., Grover, S., Chakrabarti, S., Avasthi, A., Kumar, S., 2011. Phenomenology and treatment of Catatonia: a descriptive study from north India. *Indian J. Psychiatry* 53, 36. <https://doi.org/10.4103/0019-5545.75559>.
- Fink, M., Taylor, M.A., 2006. Catatonia: subtype or syndrome in DSM? *Am. J. Psychiatry* 163, 1875–1876. <https://doi.org/10.1176/ajp.2006.163.11.1875>.
- Gangadhar, B.N., Keshavan, M.S., Goswami, U., Rao, T.V., 1983. Cortical venous thrombosis presenting as catatonia: a clinicopathologic report. *J. Clin. Psychiatry* 44, 109–110.
- Gomez, E.A., Comstock, B.S., Rosario, A., 1982. Organic versus functional etiology in catatonia: case report. *J. Clin. Psychiatry* 43, 200–201.
- Grover, S., Chakrabarti, S., Ghormode, D., Agarwal, M., Sharma, A., Avasthi, A., 2015. Catatonia in inpatients with psychiatric disorders: a comparison of schizophrenia and mood disorders. *Psychiatry Res.* 229, 919–925. <https://doi.org/10.1016/j.psychres.2015.07.020>.
- Grover, S., Chauhan, N., Sharma, A., Chakrabarti, S., Avasthi, A., 2017. Symptom profile of catatonia in children and adolescents admitted to psychiatry inpatient unit. *Asian J. Psychiatr.* 29, 91–95. <https://doi.org/10.1016/j.ajp.2017.04.016>.
- Heckers, S., Tandon, R., Bustillo, J., 2010. Catatonia in the DSM—Should we move or not. *Schizophr. Bull.* 2010 (36), 205–207.
- Johnson, J., 1993. Catatonia: the tension insanity. *Br. J. Psychiatry* 162, 733–738.
- Kaelle, J., Abujam, A., Ediriweera, H., Macfarlane, M.D., 2016. Prevalence and symptomatology of catatonia in elderly patients referred to a consultation-liaison psychiatry service. *Australas. Psychiatry* 24, 164–167. <https://doi.org/10.1177/1039856215604998>.
- Karlamangla, A., Tinetti, M., Guralnik, J., Studenski, S., Wetle, T., Reuben, D., 2007. Comorbidity in older adults: nosology of impairment, diseases, and conditions. *J. Gerontol. A Biol. Sci. Med. Sci.* 62, 296–300.
- Lee, J.W., Schwartz, D.L., Hallmayer, J., 2000. Catatonia in a psychiatric intensive care facility: incidence and response to benzodiazepines. *Ann. Clin. Psychiatry* 12, 89–96.
- Medda, P., Toni, C., Luchini, F., Mariani, M.G., Mauri, M., Perugi, G., 2015. Catatonia in 26 patients with bipolar disorder: clinical features and response to electroconvulsive therapy. *Bipolar Disord.* 17, 892–901. <https://doi.org/10.1111/bdi.12348>.
- Northoff, G., Koch, A., Wenke, J., Eckert, J., Böker, H., Pflug, B., Bogerts, B., 1999. Catatonia as a psychomotor syndrome: a rating scale and extrapyramidal motor symptoms. *Mov. Disord.* 14, 404–416.
- Rabello, F. de A.P.C.J., Luz, D.C., Figueiredo, E.C.Qde, Gaudêncio, Ede O., Coutinho, L.C.Q.M., Azevedo, W.Fde, Rabello, F. de A.P.C.J., Luz, D.C., Figueiredo, E.C.Qde, Gaudêncio, Ede O., Coutinho, L.C.Q.M., Azevedo, W.Fde, 2014. Catatonia due to systemic lupus erythematosus. *J. Bras. Psiquiatr.* 63, 177–181. <https://doi.org/10.1590/0047-2085000000022>.
- Seethalakshmi, R., Dhavale, S., Suggu, K., Dewan, M., 2008. Catatonic syndrome: importance of detection and treatment with lorazepam. *Ann. Clin. Psychiatry* 20, 5–8. <https://doi.org/10.1080/10401230701844786>.
- Sienaert, P., Rooseleer, J., De Fruyt, J., 2011. Measuring catatonia: a systematic review of rating scales. *J. Affect. Disord.* 135, 1–9. <https://doi.org/10.1016/j.jad.2011.02.012>.
- Smith, J.H., Smith, V.D., Philbrick, K.L., Kumar, N., 2012. Catatonic disorder due to a general medical or psychiatric condition. *J. Neuropsychiatry Clin. Neurosci.* 24, 198–207. <https://doi.org/10.1176/appi.neuropsych.11060120>.
- Starkstein, S.E., Petracca, G., Tesón, A., Chemerinski, E., Merello, M., Migliorelli, R., Leiguarda, R., 1996. Catatonia in depression: prevalence, clinical correlates, and validation of a scale. *J. Neurol. Neurosurg. Psychiatry* 60, 326–332.
- Swain, S.P., Behura, S.S., Dash, M.K., 2017. The phenomenology and treatment response in catatonia: a hospital based descriptive study. *Indian J. Psychol. Med.* 39, 323. <https://doi.org/10.4103/0253-7176.207338>.
- Takács, R., Asztalos, M., Ungvari, G.S., Gazdag, G., 2017. Catatonia in an inpatient gerontopsychiatric population. *Psychiatry Res.* 255, 215–218. <https://doi.org/10.1016/j.psychres.2017.05.039>.
- Takaoka, K., Takata, T., 2003. Catatonia in childhood and adolescence. *Psychiatry Clin. Neurosci.* 57, 129–137. <https://doi.org/10.1046/j.1440-1819.2003.01092.x>.
- Takata, T., Takaoka, K., Fujigaki, M., 2005. Catatonia in the elderly. *Int. J. Psychiatry Clin. Pract.* 9, 230–237. <https://doi.org/10.1080/13651500500240670>.
- Tandon, R., Heckers, S., Bustillo, J., Barch, D.M., Gaebel, W., Gur, R.E., Malaspina, D., Owen, M.J., Schultz, S., Tsuang, M., van Os, J., Carpenter, W., 2013. Catatonia in DSM-5. *Schizophr. Res.* 150, 26–30. <https://doi.org/10.1016/j.schres.2013.04.034>.
- Thakur, A., Jagadheesan, K., Dutta, S., Sinha, V.K., 2003. Incidence of catatonia in children and adolescents in a paediatric psychiatric clinic. *Aust. N. Z. J. Psychiatry* 37, 200–203. <https://doi.org/10.1046/j.1440-1614.2003.01125.x>.
- Worku, B., Pekadu, A., 2015. Symptom profile and short term outcome of catatonia: an exploratory clinical study. *BMC Psychiatry* 15. <https://doi.org/10.1186/s12888-015-0554-2>.
- World Health Organization, 1992. *The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines*. World Health Organization, Geneva.